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BUREAU OF PLANT INDUSTRY

THE PLANT DISEASE BULLETIN

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The Plant Disease Survey

SUPPLEMENT 6

Crop Losses from Plant Diseases, – 1918

August 1, 1919.

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THIS PLANT QUARANTINE BULLETIN

Issued By

The Plant Quarantine Service

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

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PLANT DISEASE SURVEY

BUREAU OF PLANT INDUSTRY

Washington, D. C. July 1, 1919.

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CROP LOSSES FROM PLANT DISEASES, 1918.

Many estimates of losses from plant diseases has been made at various times in the past but as a rule these estimates have been limited to a single disease or crop and are often scattered in numerous publications. Last year the Plant Disease Survey made an attempt to bring together in one place all disease loss estimates of some of the more important crops for the year 1917. The results were published in mimeographed form in the Plant Disease Bulletin (Pl. Dis. Bul., 2 : 1-18, 1918.) This past season much the same sort of work has been done and the results are set forth in the following tables.

METHOD OF OBTAINING ESTIMATES

The sources of information on which these estimates are based may be listed as follows:-

1. Collaborators of the Plant Disease Survey. One set of estimates was usually handed in from each state and this often represented the combined judgement of the plant pathologists at the experiment station or college. A list of collaborators is given in this bulletin.
2. Records of the 1918 cereal disease survey conducted by the Office of Cereal Investigations, U. S. Department of Agriculture.
3. Crop disease specialists in the Bureau of Plant Industry.
4. Reports and records of the Plant Disease Survey.

In the winter of 1918-1919 collaborators were provided with blank forms on which to report the losses to wheat, barley, rye, oats, corn, potatoes, bean, tomato, onion, cotton, sweet potato, apple and peach. The results obtained were summarized and a set of preliminary estimates were prepared. In these initial estimates the percentage figures were arranged in parallel columns along with those from other sources. The preliminary estimates were resubmitted to collaborators and also sent to pathologists in the Bureau of Plant Industry for additions and corrections. The following tables have been prepared taking into account the revisions that were made.

SYMBOLS

Certain symbols occur frequently in the place of figures on the following pages. Their significance is as follows:

- = no data.

t = trace. It indicates that the loss is less than 1% but data are not available for estimates beyond that. In some instances, such as the cereal smuts, where many detailed counts are available and where state estimates have been made to a fraction of a percent, t usually signifies a small fraction of 1% (less than .1% in many cases).

+ = loss occurred but amount inestimable. This is used (a) where a trace is given as the percentage loss; (b) when no production figures are given but when the percentages show some loss; (c) to indicate an excess. It is used in connection with most of the totals to signify that the actual loss is probably greater than that shown; and (d) in the case of leaf rusts of cereals where percentages of affected leaf area are available but where intelligent estimates of reduction in yield are impossible at this time.

METHODS OF CALCULATING LOSSES

In these tabulations the losses are expressed in percentages of the total crop and in amount of reduction in yield (bushels, bales, etc.). No attempt has been made to estimate money loss.

The reductions in yield were calculated by considering the production for the year as 100% minus the percentage of the crop lost by disease. Thus, Pennsylvania produced 24,718,000 bushels of wheat, the loss from bunt was estimated at .5%; therefore, 24,718,000 bushels was 99.5% of a crop. One percent equals 248,422 bushels, .5% equals 124,211 (124,000) bushels.

The average estimated percentage of loss for each disease for the United States was obtained by dividing the total reduction due to the disease by the sum of the given production plus the total reduction. Thus in the case of bunt of wheat the reduction in yield for the United States totaled 19,063,000 bushels, which is found to be approximately 2% of 950,271,000 bushels (917, 100,000 + 33,171,000, the production + the reduction).

WHEAT

Estimated probable reduction in yield of wheat due to bunt (Tilletia laevis and T. tritici), loose smut (Ustilago tritici), scab (Fusarium sp.), stem rust Puccinia graminis) and leaf rust (Puccinia triticina), 1918.

State	Production 1918 Bushels 000 omitted	Estimated Reduction in yield due to diseases											
		Bunt		Loose Smut		Scab		Stem Rust		Leaf Rust			
		%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted
Me.	506	.5	3	.7	4	.4	2	-	-	-	-	-	-
N. H.		t	+	.7	+	.3	+	-	-	-	-	-	-
Vt.	396	t	+	.8	3	.2	1	t	+				
Mass.		.5	+	.4	+	t	+	t	+	t	+		
R. I.		t	+	.5	+	-	-	-	-	-	-	-	-
Conn.		t	+	1.	+	t	+	-	-	-	-	-	-
N. Y.	7,840	.5	39	.5	39	t	+	-	-	-	-	-	-
N. J.	1,700	.7	12	1.4	24	t	+	-	-	-	-	-	-
Penn.	24,718	.5	124	1.7	427	3.	77	.3	74	t	+		
Del.	1,729												
Md.	11,346	.3	34	4.	473	1.	115			t	+		
Va.	15,600	2.8	449	3.	482	1.5	238	t	+	t	+		
W. Va.	4,942	1.	50	2.	101	1.5	75	t	+	t	+		
N. C.	7,105	.7	50	2.7	197	t	+			t	+		
S. C.	2,255	.6	14	1.8	41	t	+	t	+	t	+		
Ga.	3,631	1.4	52	4.	151	t	+	t	+	t	+		
Ohio	43,547	.9	395	1.9	843	2.	889	.1	44	t	+		
Ind.	49,427	2.7	1,362	2.4	1,215	1.	499	t	+	t	+		
Ill.	60,991	1.9	1,181	1.5	929	1.	616	t	+				
Mich.	10,716	3.6	400	.6	65	t	+	.5	54	t	+		
Wisc.	9,837	.9	89	t	+	.3	30	.5	49	-	-		
Minn.	79,710	3.5	2,891	.5	401	.3	240	.1	80	-	-		
Iowa	19,650	1.1	219	.4	79	1.5	299	t	+	-	-		
Mo.	53,154	1.6	864	1.1	591	t	+	t	+	-	-		
N. D.	101,010	1.6	1,642	.5	508	t	+	-	-	-	-		
S. D.	71,305	2.1	1,530	1.5	1,086	.4	286	.7	503	-	-		

Neb.	43,141	6.	2,754	.5	217	t	+		t	+		-	+						
Kans.	102,008	1.1	1,135	.4	410	-	-		t			-	-						
Ky.	12,129	.3	36	.7	85	3.2		401	t			t	+						
Tenn.	7,500	3.	232	1.	76	2.2		169	t	+		t	+						
Ala.	1,530	2.	27	1.	13	t	+		-	-		t	+						
Miss.	495	1.3	7	1.4	7	-	-		-	-		t	+						
La.		t	+	t	-	-	-		-	-		t	+						
Tex.	3,920	t	+	.7	63	-	-			-									
Okla.	32,899	.4	132	.6	132	-	-			-		t	+						
Ark.	3,048	6.	194	5.	160	t	+		-	-		t	+						
Mont.	25,434	3.	787	2.	519	t	+		-	-		-	-						
Wyo.	6,600	1.	67	t		-	-			-		-	-						
Col.	13,335	6.	851	.2	27					-		-	-						
N. Mex.	5,334			t	+	-	-			-		-	-						
Ariz.	988	2.	22	t	+					-		-	-						
Utah	6,464					-	-			-		-	-						
Nev.	1,070			t	+	-	-			-		-	-						
Idaho	18,043					-	-			-		-	-						
Wash.	26,429	2.4	650	t	+	-	-			-		-	-						
Oreg.	15,228	1.	154	t	+	-	-			-		-	-						
Calif.	7,590	7.5	615	t	+								-						
U. S.	917,100	2.0	19,063+	1.0	9,368+	.4*		3,936+	.1		804+		+						

Estimated total reduction due to disease, United States 3.5 33,171+

*The estimates for scab in 1917 (1.49%) were probably too high. The figures for that year represent better the percentage of affected heads rather than reduction in yield.

RYE

Estimated reduction in yield of rye due to stem smut (Urocystis occulta) and ergot (Claviceps purpurea), 1918.

State	Production 1918 Bushels :000 omitted	Estimated reduction in yield due to diseases				
		Smut		Ergot		
		%	Bushels :000 omitted	%	Bushels :000 omitted	
Vermont	21	0	0	0	0	
Massachusetts	80	t	+	t	+	
Rhode Island	-	t	+	0	0	
Connecticut	242	t	+	t	+	
New York	1,848	t	+	t	+	
New Jersey	1,350	0	0	.3	4	
Pennsylvania	4,250	t	+	.5	21	
Delaware	14	-	-	-	-	
Maryland	450	t	+	-	-	
Virginia	1,200	t	+	-	-	
West Virginia	301	0	0	-	-	
North Carolina	480	t	+	-	-	
South Carolina	202	t	+	0	0	
Georgia	176	0	0	t	+	
Ohio	1,887	1.3	25	-	-	
Indiana	6,765	-	-	.2	14	
Illinois	3,800	1.0	38	.2	8	
Michigan	6,750	t	+	t	+	
Wisconsin	7,674	0.5	39	.21	16	
Minnesota	8,700	0.8	70	.13	11	
Iowa	1,026	0.2	2	.23	2	
Missouri	476	.3	1	t	+	
North Dakota	20,422	-	-	.01	2	
South Dakota	10,350	-	-	-	-	
Nebraska	5,005	0	0	t	+	
Kansas	2,431	0	0	t	+	
Kentucky	884	0	0	t	+	
Tennessee	300	0	0	-	-	
Alabama	44	t	+	-	-	
Texas	22	.5	+	-	-	
Oklahoma	88	1.5	1	-	-	
Arkansas	21	0	0	.2	+	
Montana	240	0	0	-	-	
Wyoming	450	0	0	-	-	
Colorado	324	0	0	-	-	
Utah	208	0	0	-	-	
Idaho	60	0	0	-	-	
Washington	70	0	0	-	-	
Oregon	492	-	-	-	-	

United States	89,103	.19	176+	.09*	78+	
Total reduction due to smut and ergot				.28	254+	

*The estimates for ergot in 1917 were probably too high. The figures for that year represent better the % affected heads rather than actual reduction in yield of grain.

BARLEY

Estimated reduction in yield of barley due to stripe (*Helminthosporium gramineum*), loose smut (*Ustilago nuda*), and covered smut (*Ustilago hordei*), 1918.

State	Production 1918 Bushels :000 omitted	Estimated reduction in yield due to diseases					
		Stripe		Loose Smut		Covered Smut	
		%	Bushels :000 omitted	%	Bushels :000 omitted	%	Bushels :000 omitted
Maine	300			.8	2	.9	3
New Hampshire	32	1.1	+	1.2	+	.8	+
Vermont	496	.7	4	1.	5	.6	3
Massachusetts		t	+	.5	+	.6	+
Rhode Island				.8	+	1.	+
Connecticut		2.5	+	2.	+	.2	+
New York	3,938	.5	20	2.	80	.8	32
New Jersey				1.	+	.5	+
Pennsylvania	420			4.	18	t	+
Maryland	186			5.	10	3.	6
Virginia	324			1.	3		
West Virginia				2.6	+		
South Carolina				2.	+	t	+
Georgia				2.	+	5.	+
Ohio	3,150	2.	64	2.7	87	2.6	84
Indiana	1,665	3.1	53	5.7	101	t	+
Illinois	9,000			3.	278	2.	184
Michigan	8,332	2.5	214	.6	50	3.	258
Wisconsin	25,383	4.6	1,224	.8	205	1.2	308
Minnesota	43,400	1.5	661	1.	438	1.	438
Iowa	11,340	4.4	522	.3	34	.5	57
Missouri	250	t	+	2.	5	1.	3
North Dakota	37,281	4.	1,553	1.	377	2.5	956
South Dakota	41,300	9.8	4,487	.6	249	2.1	886
Nebraska	5,660	t	+	2.	116	2.	116
Kansas	6,040	t	+	.5	30	.5	30
Kentucky	196						
Tennessee	184			5.	10		
Alabama				5.	+	t	+
Mississippi				7.	+	4.	+
Louisiana				t	+	t	+
Texas	170			3.	5	5.5	10
Oklahoma	136			8.	12	5.7	8
Arkansas		t	+				
Montana	1,914	t	+	1.	19	.5	10
Wyoming	1,110	t	+			.8	9
Colorado	4,928			.8	40	.2	99

New Mexico	392										
Arizona	1,020	t		+				1.		10	
Utah	1,120										
Nevada	408				t		+	3.		13	
Idaho	4,900										
Washington	2,630				t		+	.8		21	
Oregon	4,450										
California	34,320				.6		207	5.		1806	
United States	256,375	3.2		8,802	+ .9		2,381	+ 2.		5,350	+

Total reduction in yield due to stripe and the smuts 6.1 16,533

OAT

Estimated reduction in yield of oats due to smuts (*Ustilago avenae* and *U. levis*), 1918.

State	Production 1918 Bushels 000 omitted	Estimated reduction in yield due to smut %	Estimated reduction in yield due to smut Bushels 000 omitted
Maine	6,760	2.4	166
New Hampshire	912	3.	28
Vermont	4,223	2.8	122
Massachusetts	480	6.	31
Rhode Island	84	6.5	6
Connecticut	912	2.5	23
New York	51,660	3.3	1,763
New Jersey	3,400	2.3	80
Pennsylvania	47,190	4.5	2,224
Maryland.	1,980	3.0	61
Virginia	5,175	5.	272
West Virginia	4,320	1.8	79
North Carolina	6,500	8.2	582
South Carolina	11,000	7.0	828
Georgia	12,000	7.6	987
Ohio	79,200	7.2	6,145
Indiana	85,050	3.6	3,176
Illinois	198,352	6.0	12,661
Michigan	66,520	6.	4,233
Wisconsin	110,162	3.	3,407
Minnesota	134,562	2.6	3,592
Iowa	229,572	1.1	2,553
Missouri	44,196	4.0	1,841
North Dakota	60,512	4.9	3,115
South Dakota	84,240	3.2	2,785
Nebraska	56,188	4.5	2,648
Kansas	51,238	4.5	2,414
Kentucky	9,600	5.	505
Tennessee	8,125	5.	428
Alabama	8,132	5.	428
Mississippi	5,600	5.	295
Louisiana	2,000	2.7	55
Texas	22,197	8.5	2,062
Oklahoma	33,120	5.5	1,965
Arkansas	11,271	6.5	1,047
Montana	20,400	2.0	416
Wyoming	11,685	2.5	300
Colorado	9,669	5.8	595
Arizona	440	2.0	9
Nevada	532	5.	28
Washington	8,370	3.	259
Oregon	9,025	1.	291
California	5,600	1.6	291
Other states	16,405		
United States	1,538,359	4.2	64,396

CORN

Estimated reduction in yield of corn due to smut (Ustilago zeae), leaf rust (Puccinia sorghi), brown spot (Physoderma zeae-maydis) and root and ear rots (Fusarium sp.), 1918.

State	Production 1918 Bushels 000 omitted	Estimated reduction in yield due to diseases									
		Smut		Leaf rust		Brown Spot (Physoderma)		Root and ear rot	
		%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted
Maine	1,215	t	+	0	0	0	0	-	-
New Hampshire	1,260	-	-	0	0	0	0	-	-
Vermont	1,710	-	-	0	0	0	0	-	-
Massachusetts	2,080	.5	10	t	+	0	0	t	+
Rhode Island	572	-	-	t	+	0	0	-	-
Connecticut	2,800	.1	3	t	+	0	0	1.	28
New York	29,520	1.	298	t	+	0	0	.4	119
New Jersey	11,439	1.	115	t	+	0	0	2.	233
Pennsylvania	62,400	3.	1,930	t	+	0	0	18.	13,697
Delaware	7,285	-	-	0	0	0	0	-	-
Maryland	24,010	1.	243	t	+	t	+	t	+
Virginia	56,000	1.	566	0	0	t	+	2.	1,143
West Virginia	24,800	4.	1,033	0	0	0	0	2.	506
North Carolina	64,365	3.	1,991	-	-	1.	650	1.	650
South Carolina	38,250	2.	781	-	-	4.	1,594	2.	781
Georgia	68,850	5.	3,624	.6	416	3.	2,129	4.	2,869
Florida	14,080	-	-	+	+	t	+	-	-
Ohio	133,200	3.	4,120	0	0	t	+	4.	5,550
Indiana	169,554	-	-	-	-	-	-	3.	5,244
Illinois	351,450	1.5	5,352	-	-	t	+	3.	10,870
Michigan	48,300	1.	488	0	0	0	0	t	+
Wisconsin	69,538	.5	349	0	0	0	0	1.	702
Minnesota	110,000	.5	553	.2	220	0	0	1.	1,111
Iowa	375,624	2.5	9,631	.3	1,130	0	0	.5	1,888
Missouri	133,860	1.	1,352	.2	268			1.	1,352

North Dakota	9,196	1.5	140	-	-	t	+	1.	93					
South Dakota	108,188	5.	5,694	-	-	0	0	2.	2,208					
Nebraska	123,086	5.	6,478	0	0	0	0	2.	2,492					
Kansas	43,523	8.	3,785	-	-	0	0	2.	888					
Kentucky	93,600	1.5	1,425	.4	376	t	+	8.	8,139					
Tennessee	84,000	7.	6,323	.8	677	1.5	1,279	8.	7,304					
Alabama	67,686	2.5	1,736	0	0	.5	340	-	-					
Mississippi	66,300	.5	333	-	-	1.	670	4.	2,762					
Louisiana	29,600	1.5	451	3.	915	.5	149	2.	604					
Texas	69,000	8.	6,000	t	+	t	+	5.	3,632					
Oklahoma	24,375	4.	1,016	t	+	t	+	5.	1,283					
Arkansas	35,100	.2	70	t	+	t	+	2.	716					
Montana	2,100	t	+	0	0	0	0	0	0					
Wyoming	1,000	t	+	0	0	0	0	-	-					
Colorado	11,067	30.	4,743	0	0	0	0	-	-					
New Mexico	4,250	5.	224	-	-	0	0	-	-					
Arizona	952	2.	19	-	-	0	0	-	-					
Utah	672	t	+	-	-	0	0	-	-					
Nevada	64	t	+	-	-	0	0	-	-					
Idaho	920	t	+	-	-	0	0	-	-					
Washington	1,634	t	+	0	0	0	0	0	0					
Oregon	1,364	t	+	0	0	0	0	-	-					
California	2,975	t	+	-	-	0	0	-	-					
United States	2,582,814	2.6	70,876	.1	4,002	.3	6,811	2.8	76,864					
Estimated total loss due to above diseases								5.8	158,533					

Estimated reduction in yield of potatoes due to late blight (*Phytophthora infestans*), Rhizoctonia, black leg (*Bacillus atrosepticus*), Fusarium wilt (*Fusarium oxysporum*), early blight (*Macrosporium solani*), 1918.

State	Production 1918	Estimated reduction in yield due to diseases											
	Bushels	Late blight		Rhizoctonia		Black leg		Fusarium wilt		Early blight	
	000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted
Maine	22,400	15.	3,953	-	-	.4	90	0	0	0	0
New Hampshire	2,940	10.	327	-	-	t	+	0	0	5.	155
Vermont	3,380	10.	376	1.	34	t	+	0	0	5.	178
Massachusetts	4,788	3.	148	-	-	.2	10	t	+	1.	48
Rhode Island	650	2.	13	-	-	t	+	t	+	1.	7
Connecticut	2,470	1.	25	t	+	.3	7	t	+	t	+
New York	34,960	1.	353	5.	1,840	t	+	1.	353	t	+
New Jersey	8,464	1.	85	3.	262	t	+	.5	43	10.	940
Pennsylvania	24,400	2.	498	5.	1,284	.5	123	6.	1,558	7.	1,837
Delaware	957	1.	10	-	-	t	+	-	-	4.	40
Maryland	4,000	t	+	2.	82	t	+	1.	40	5.	211
Virginia	11,750	t	+	-	-	t	+	-	-	-	-
West Virginia	5,220	3.	161	-	-	.5	26	2.	107	.1	5
North Carolina	4,275	t	+	-	-	-	-	t	+	-	-
South Carolina	2,856	t	+	3.	88	-	-	t	+	1.	29
Georgia	1,610	1.	16	-	-	t	+	0	0	10.	179
Florida	3,500	5.	184	t	+	-	-	0	0	-	-
Ohio	11,040	0	0	-	-	-	-	3.	341	-	-
Indiana	7,760	0	0	-	-	-	-	5.	408	-	-
Illinois	11,520	0	0	-	-	-	-	5.	606	-	-
Michigan	28,560	0	0	4.	1,190	.1	29	5.	1,503	-	-
Wisconsin	33,040	t	+	3.	1,022	.5	166	t	+	1.	334
Minnesota	32,760	.3	99	2.	669	3.	1,013	1.5	499	1.	331
Iowa	9,648	1.	97	-	-	-	-	1.	97	-	-
Missouri	6,954	0	0	t	+	t	+	1.5	106	-	-

North Dakota	8,910	0	0	4.	371	2.	182	5.	469	.1	9								
South Dakota	8,190	0	0	-	-	t	+	5.	431	-	-								
Nebraska	10,406	0	0	2.	212	t	+	4.	434	0	0								
Kansas	4,240	0	0	5.	223	t	+	.5	21	t	+								
Kentucky	5,625	0	0	-	-	0	0	2.	115	1.	57								
Tennessee	5,500	0	0	-	-	-	-	1.	35	8.	304								
Alabama	4,800	t	+	0	0	0	0	t	+		0								
Mississippi	1,600	t	+	-	-	-	-	t	+		-								
Louisiana	4,345	t	+	t	+	0	0	0	0	4.	181								
Texas	3,300	0	0	1.	33	-	-	5.	174	1.	33								
Oklahoma	1,258	0	0	-	-	-	-	1.	13	.5	6								
Arkansas	2,400	50.	2,400	t	+	-	-	2.	49	t	+								
Montana	7,020	0	0	1.	71	3.	217	1.	71	0	0								
Wyoming	4,500	0	0	5.	237	-	-	3.	139	-	-								
Colorado	11,376	0	0	2.5	292	-	-	6.	726	t	+								
New Mexico	1,000	0	0	-	-	-	-	10.	111	-	-								
Arizona	425	0	0	5.	22	-	22	10.	47	t	+								
Utah	3,600	0	0	-	-	-	-	15.	635	-	-								
Nevada	1,539	0	0	2.	31	-	-	10.	171	-	-								
Idaho	5,220	0	0	-	-	-	-	15.	921	-	-								
Washington	8,580	t	+	15.	1,514	3.	26	3.	26	0	0								
Oregon	5,500	0	0	10.	611	2.	112	3.	17	t	+								
California	12,870	0	0	2.	263	-	-	6.	871	2.	263								
United States	400,106	1.8	8,745+	2.2	10,351+	.4	2,001+	2.3	11,087+	1.07	5,147+								

POTATO (continued)

Estimated reduction in yield of potatoes due to mosaic, leaf roll, Verticillium wilt (*Verticillium albo-atrum*) and tip burn, 1918.

State	Production 1918 Bushels 000 omitted	Estimated reduction in yield due to diseases									
		Mosaic		Leaf roll		Verticillium wilt		Tip burn			
		%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted		
Maine	22,400	10.	2,489	t	+	t	+	0	0		
New Hampshire	2,940	15.	519	-	-	-	-	t	+		
Vermont	3,380	15.	596	-	-	-	-	t	+		
Massachusetts	4,788	8.	416	1.	48	t	+	4.	199		
Rhode Island	650	2.	13	-	-	-	-	3.	20		
Connecticut	2,470	1.	25	.3	7	-	-	2.	50		
New York	34,960	4.5	1,647	4.	1,457	t	+	1.	353		
New Jersey	8,464	10.	940	8.	736	0	0	20.	2,116		
Pennsylvania	24,400	5.	1,284	10.	2,711	0	0	15.	4,306		
Delaware	957	t	-	-	-	0	0	15.	169		
Maryland	4,000		+	-	-	0	0	8.	348		
Virginia	11,750	t	+	-	-	0	0	t			
West Virginia	5,220	t	+	-	-	0	0	10.	580		
North Carolina	4,275	.5	21	-	-	0	0	t	+		
South Carolina	2,856	1.	29	-	-	0	0	t	+		
Georgia	1,610	1.	16	t	+	0	0	t	+		
Florida	3,500	2.	71	-	+	0	0	0	0		
Ohio	11,040	1.	112	-	-	-	-	5.	581		
Indiana	7,760	t	+	-	-	0	0	5.	+		
Illinois	11,520	t	+	-	-	0	0	5.	606		
Michigan	28,560	1.	288	t	+	-	-	20.	7,140		
Wisconsin	33,040	t	+	t	+	t	+	8.	2,873		
Minnesota	32,760	t	+	1.	331	-	-	2.	669		
Iowa	9,648	t	+	-	-	0	0	.3	19		
Missouri	6,954	t	+	-	-	0	0	2.	142		

North Dakota	8,910	t	+	t	+	t	+	2.	182
South Dakota	8,190	t	+	-	-	0	0	3.	253
Nebraska	10,406	t	+	t	+	0	0	12.	1,419
Kansas	4,240	t	+	-	-	0	0	10.	471
Kentucky	5,625	t	+	-	-	0	0	2.	115
Tennessee	3,500	2.	71	-	-	0	0	1.	35
Alabama	4,800	15.	847	-	-	0	0	t	+
Mississippi	1,600	12.	218	-	-	0	0	t	+
Louisiana	4,345	15.	767	-	-	0	0	t	+
Texas	3,300	7.	248	.5	17	0	0	5.	174
Oklahoma	1,258	2.	26	-	-	0	0	5.	66
Arkansas	2,400	4.	100	1.	24	0	0	1.	24
Montana	7,020	t	+	2.	134	0	0	0	0
Wyoming	4,500	-	-	-	-	0	0	0	0
Colorado	11,376	t	+	-	-	0	0	0	0
New Mexico	1,000	-	-	-	-	0	0	?	?
Arizona	425		-	-	-	0	0	?	?
Utah	3,600		-	-	-	0	0	?	?
Nevada	1,539		-	-	-	0	0	?	?
Idaho	5,220		-	-	-	-	-	?	?
Washington	8,580	t	+	t	+	-	-	0	0
Oregon	5,500	t	+	-	-	5.	289	?	?
California	12,870	2.	263	6.	821	t	+	2.	263
United States	400,106	2.3	11,006+	1.3	6,295+	.06	289+	4.9	23,173+

Total reduction in yield from above diseases	16.33	78,094

BEAN

Estimated reduction in yield of dry edible and snap beans due to anthracnose (Colletotrichum lindemuthianum), bacterial blight (Bacterium phaseoli) and mosaic, 1918.

State	Production 1918 Bushels 000 omitted	Estimated reduction in yield due to diseases													
		Anthracnose		Bacterial blight		Mosaic		Root rots		Other diseases					
		%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted
Maine	330*	18.	72	t		-	-	t	+						
New Hampshire	100*	10.	11	1.	1	-	-	-	-						
Vermont	100*	12.	14	t	+	t	+	-	-						
Massachusetts	12*	1.	+	2.	+	2.	+	t	+	1.	+				
Rhode Island		.5	+	1.	+	-	-	-	-						
Connecticut		.3	+	.3	+	t	+	-	-						
New York	1,660	1.	17	7.	125	15.	293	8.	144	0	0				
New Jersey	23*	3.	+	.5	+	8.	2	-	0						
Pennsylvania	54*	7.	4	6.	3	15.	10	3.	2	7.5	4				
Maryland	63*	2.	1	1.5	1	t	+	t	+	t	+				
Virginia		8.	+	5.	+	t	+	t	+	10.	+				
West Virginia	144*	6.	9	1.	1	t	+	-	-	2.	3				
South Carolina		t	+	2.	+	-	-	t	+	2.	+				
Georgia	44*	t	+	1.	+	0	0	t	+						
Florida		1.	+	t	+	-	-	-	-						
Ohio	87*	5.	5	-	-	-	-	t	+						
Indiana	35*	-		-	-	t	+	-	-						
Illinois		-		-	-	-	-	-	-						
Michigan	4,887	t	+	2.	100	2.	100	0	0						
Wisconsin	133	.5	1	1.5	2	t	+	t	+	t	+				
Minnesota	10*	5.	1	4.	+	-	-	t	+						
Iowa	42*			-	-	-	-	-	-						
Missouri	87*	.5	+	0	0	-	-	-	-						
North Dakota		t	+	4.	+	-	-	t	+						
South Dakota		t	+	-	-	t	+		-						
Nebraska	107*	t	+	t	+	0	0	t	+						
Kansas		2.	+	.5	+	1.	+	-	-						
Kentucky	132*	2.	3	-	-	t	+	-	-	0	0				

Kentucky : 132* : 2. : 3 : - : - : t :

Tennessee	93*	6.	6	8.	8	5.	5	-	-		
Alabama		3.	+	-	-	t	+	-	-		
Mississippi		5.	+	t	+	-	-	t	-		
Louisiana		3.	+	7.	+	3.	+	3.	+		
Texas		t	+	5.	+	2.	+	5.	+	1.	
Oklahoma		t	+	t	+	-	-	-	-		
Arkansas		t	+	t	+	4.	+	-	-		
Montana	88*	0	0	3.	3	-	-	-	-	0	0
Wyoming	42*	-	-	-	-	-	-	-	-		
Colorado	1,638	5.	86	35.	882	-	-	5.	86	.5	8
New Mexico	596	0	0	t	+	0	0	-	-		
Arizona	72	0	0	t	+	0	0	-	-		
Idaho	377*	0	0	0	0	t	+	-	-		
Washington	122*	0	0	0	0	t	+	2.	2		
Oregon	91*	0	0	t	+	20.	23	-	-		
California	8,880	?		-	-	t	+	-	-	20.	2,220
United States	20,049	.94	230+	4.63	1,126+	1.78	433+	.96	234+	9.19	2,235+
Estimated total loss from above diseases										17.51	4,258+ bu.

* = Production 1917. No estimates available for 1918.
* = Root rots include injuries due to Fusarium Rhizoctonia, Ozonium (in Texas).

TOMATO

Estimated reduction in yield of tomatoes due to leaf blight (*Septoria lycopersici*), Fusarium wilt (*Fusarium lycopersici*), bacterial wilt (*Bacillus solanacearum*) and early blight (*Macrosporium solani*), 1918.

State	Production 1918 Bushels :000 omitted	Estimated reduction in yield due to disease							
		Leaf blight		Fusarium wilt		Bacterial wilt		Early blight	
		%	Bushels :000 omitted	%	Bushels :000 omitted	%	Bushels :000 omitted	%	Bushels :000 omitted
Massachusetts		0	0	t	+	0	0	1.	+
Rhode Island		.5	+	t	+	0	0	-	-
Connecticut	798	.5	4	t	+	0	0	.2	16
New York	57,661	5.	3,035	t	+	0	0	.8	465
New Jersey	268,930	25.	89,643	1.	2,717	0	0	4.	11,205
Pennsylvania	34,824	3.	1,077	5.	1,833	0	0	1.	352
Delaware	143,245	25.	47,748	9.	14,167	-	-	-	-
Maryland	316,986	40.	211,324	15.	55,959	t	-	t	+
Virginia	69,108	33.	34,038	5.	3,637	2.	1,410	1.	698
West Virginia	2,545	5.	134	2.	52	.5	13	2.	52
North Carolina		12.	+	8.	+	7.	+	-	-
South Carolina	20	7.	2	8.	2	12.	3	1.	+
Georgia		5.	+	25.	+	5.	+	t	+
Florida	57,658	-	-	7.	4,340	5.	3,035	30.	24,710
Ohio	54,222	15.	9,567	-	-	t	+	2.	1,107
Indiana	219,753	20.	54,938	-	-	t	+	-	-
Illinois	12,606	0	-	-	-	0	0	-	-
Michigan	21,069	t	+	-	-	0	0	t	+
Wisconsin	1,617	t	+	t	+	0	0	t	+
Minnesota	267	2.	5	0	0	0	0	t	+
Iowa	6,825	-	-	-	-	0	0	-	-
Missouri	17,563	5.	924	1.5	268	0	0	4.	732
South Dakota	78	-	-	-	-	0	0	0	0
Nebraska	304	t	+	t	+	0	0	0	0
Kansas	146	1.	1	t	+	0	0	0	0
Kentucky	27,258	4.	1,386	-	-	t	+	5.	1,435
Tennessee	23,001	5.	1,211	10.	2,556	2.	469	3.	711
Alabama		5.	+	20	+	-	-	-	-

Tennessee	23,001	5.	1,211	20	+	-	-	-	-						
Alabama		5.	+	20	+	-	-	-	-						
Mississippi	16,472	3.	509	12.	2,246	-	-	-	-						
Louisiana	600	0	0	15.	106	0		30.	257						
Texas	63,467	1.	641	30.	27,200	2.	1,295	t	+						
Oklahoma	276	.3	1	5.	15	0	0	t	+						
Arkansas	5,725	t	+	5.	301	1.	58	0	0						
Colorado	11,499	1.	116	-	-	t	+	0	0						
New Mexico	1,492	t	+	-	-	-	-	+	+						
Utah	12,317	-	-	-	-	0	0	-	-						
Washington	77	0	0	-	-	0	0	0	0						
Oregon	985	-	-	-	-	0	0	0	0						
California	253,161	-	-	-	-	5.	13,324	-	-						
United States	1,702,555	18.2	456,304	4.6	115,379+	.8	19,607+	1.7	41,740+						
Estimated total reduction due to above diseases								30.	801,763+						

SWEET POTATO

Estimated reduction in yield of sweet potatoes due to stem rot (Fusarium hyperoxysporum and F. batatis), foot rot (Plenodomus destruens), black rot (Sphaeronema fimbriatum), soil rot (Cystospora batata) and storage rots caused by various organisms, 1918.

State	Production 1918 Bushels :000 omitted	Estimated reduction in yield due to diseases											
		Stem rot		Foot rot		Black rot		Storage rot		Soil rot			
		%	Bushels :000 omitted	%	Bushels :000 omitted	%	Bushels :000 omitted	%	Bushels :000 omitted	%	Bushels :000 omitted		
New Jersey	2,875	18.	631	t	+	5.	151	25.	958	.5	15		
Pennsylvania	120	-	-	0	0	1.	1	-					
Delaware	600	20.	150	0	0	4.	25	25.	200	2.	12		
Maryland	1,430	10.	158	1.	15	4.	60	10.	159	t	+		
Virginia	3,360	8.	292	2.	69	2.	69	40.	2,240	.5	17		
West Virginia	212	-	-	0	0	-	-	-					
North Carolina	8,910	2.	182	0	0	5.	469	40.	5,940				
South Carolina	7,600	2.	155	0	0	7.	572	40.	5,066				
Georgia	11,960	-	-	0	0	10.	1,329	30.	5,126				
Florida	3,960	-	-	t	+	2.	81	-					
Ohio	96	4.	4	2.	2	-	-	-					
Indiana	324	-	-	0	0	-	-	-					
Illinois	656	2.	13	0	0	-	-	-					
Iowa	279	5.	15	3.	9	-	-	-					
Missouri	728	-	-	.5	4	-	-	-					
Kansas	320	6.	20	t	+	3.	10	20.	80	+	+		
Kentucky	1,235	t	+	0	0	1.	13	25.	412				
Tennessee	2,940	1.	30	0	0	10.	327	25.	980				
Alabama	14,688	1.	148	0	0	3.	454	35.	7,909				
Mississippi	8,455	-	-	0	0	3.	262	35.	4,553				
Louisiana	4,875	t		0	0	3.	151	30.	2,089				
Texas	5,046	1.	51	0	0	8.	439	30.	2,163	+	+		
Oklahoma	975	2.	20	0	0	3.	30	30.	418				

Oklahoma	975	2.	20	0	0	3.	30	30.	416										
Arkansas	3,420	2.	70	0	0	2.	70	35.	1,842	+	+								
New Mexico	250	-	-	0	0	2.	5												
California	1,020	3.	30	1.	10	2.	21	25.	340										
United States	86,334	1.5	1,969+	.08	109+	3.4	4,539	30.3	40,475	.03	44+								
Total reduction in yield from above diseases										35.3	47,136+								

COTTON

Estimated reduction in yield of lint cotton due to anthracnose (Colletotrichum gossypii), angular leaf spot (Bacterium malvacearum), wilt (Fusarium vasinfectum), root-knot (Heterodera radicicola), and potash hunger (non-parasitic), 1918.

State	Production 1918 Bales :000 omitted	Estimated reduction in yield due to diseases											
		Anthracnose		Angular leaf spot		Wilt		Root knot		Potash hunger	
		%	Bales :000 omitted	%	Bales :000 omitted	%	Bales :000 omitted	%	Bales :000 omitted	%	Bales :000 omitted
Virginia	26	1.	+	-	-	-	-	-	-		
North Carolina	870	2.	18	-	-	3.	27	-	-	10.	97
South Carolina	1,500	1.	15	3.	46	2.	31	3.	46	20.	375
Georgia	2,100	8.	183	1.5	32	8.	183	3.	65	15.	371
Florida	25	7.	2	-	-	1.	-	-	-		
Missouri	70	-	-	-	-	-	-	-	-		
Tennessee	330	3.	10	1.	3	1.5	5				
Alabama	820	.5	4	.5	4	7.	62	-	-	10.	91
Mississippi	1,210	1.	12	.5	6	5.	64	2.	25	8.	105
Louisiana	525	1.5	8	1.5	8	5.	28	2.	11	-	-
Texas	2,580	1.5	39	1.	26	1.5	39	1.	26	-	-
Oklahoma	550	-	-	.3	2	2.	11	1.	6	-	-
Arkansas	935	-	-	.5	5	3.	29	-	-	4.	39
Arizona	51	-	-	2.	1						
California	100										
Other states	8										
United States	11,700	2.1	291	.9	133	3.5	479	1.3	179	7.8	1,078
Total reduction in yield from above diseases										15.6	2,160

Estimated reduction in yield of onions due to smut (Urocystis cepulae) and other diseases.

State	Production 1918 Bushels 000 omitted	Estimated reduction in yield due to diseases				
		Smut			Other diseases	
		%	Bushels 000 omitted		%	Bushels 000 omitted
Massachusetts	2,185	2.	45		3.	68
New York	3,570	15.	630		1.	36
New Jersey	640					
Pennsylvania	56	2.	1		2.	1
Ohio	1,887	3.	58		-	-
Indiana	1,067					
Michigan	496					
Wisconsin	343					
Minnesota	561					
Iowa	360					
Kentucky	255					
Louisiana	135	-	-		20.	34
Texas	2,912	-	-		30.	1,248
Colorado	329					
Utah	51					
Idaho	17					
Washington	421				.5	2
Oregon	176	10.	20		-	-
California	3,358	-	-		10.	373
United States	18,819	3.5	754		8.3	1,762

Total reduction due to diseases 11.8 2,516 bushels

PEACH

Estimated reduction in yield of peaches due to leaf curl (Exoascus deformans), brown rot (Sclerotinia cinerea), and other diseases including scab, yellows and Coryneum blight.

State	Production 1918 Bushels :000 omitted	Estimated reduction in yield due to diseases: Leaf curl %	Leaf curl Bushels :000 omitted	Brown rot %	Brown rot Bushels :000 omitted	Other diseases %	Other diseases Bushels :000 omitted
Massachusetts	9	t	+	t	+	t	+
Rhode Island	2	t	+	t	+	t	+
Connecticut	15	t	+	t	+	t	
New York	1,167	t	+	1.	12	5.	61
New Jersey	792	t	+	5.	42	8.	69
Pennsylvania	1,210	1.5	18	15.	213	8.	105
Delaware	284	2.	6	10.	32	5.	15
Maryland	600	1.5	9	8.	52	3.	19
Virginia	578	2.	12	8.	50	t	+
West Virginia	850	2.	17	t	+	5.	45
North Carolina	1,035	1.5	16	10.	115	—	—
South Carolina	1,064	1.5	16	10.	118	8.	93
Georgia	6,746	1.	68	10.	750	8.	587
Florida	264	0	0	t	+	—	—
Ohio	348	t	+	2.	7	—	—
Indiana	92	t	+	0	0	—	—
Illinois	78	0	0	0	0	0	0
Michigan	248	t	+	t	+	—	—
Kentucky	110	t	+	t	+	—	—
Tennessee	840	t	+	t	+	—	—
Alabama	3,142	0	0	10.	349	5.	165
Mississippi	1,386	t	+	10.	154	10.	154
Louisiana	615	0	0	10.	68	—	—
Texas	2,041	0	0	2.	42	8.	177
Oklahoma	303	t	+	1.	3	t	+
Arkansas	260	t	+	2.	5	t	+
Colorado	754	0	0	0	0	—	—
New Mexico	85	0	0	0	0	—	—
Arizona	58	0	0	0	0	—	—
Utah	1,080	—	—	—	—	—	—
Nevada	15	0	0	—	—	—	—
Idaho	80	0	0	—	—	—	—
Washington	1,130	t	+	—	—	t	+
Oregon	118	t	+	t	+	t	+
California	11,570	t	+	—	—	t	+
United States	38,969	.4	162+	4.7	2,012+	3.5	1,490+
Total reduction due to diseases						8.6	3,664+

APPLE

Estimated reduction in yield of apples due to bitter rot (Glomerella cingulata), black rot, (Physalospora cydoniae), blotch (Phyllosticta solitaria), fire blight (Bacillus amylovorus), scab (Venturia inaequalis), and other diseases, 1918.

tate	Production 1918 Bushels :000 omitted	Estimated reduction in yield due to diseases: Bitter rot %	Bitter rot Bushels :000 omitted	Black rot %	Black rot Bushels :000 omitted	Blotch %	Blotch Bushels :000 omitted	Fire blight %	Fire blight Bushels :000 omitted	Scab %	Scab Bushels :000 omitted	Other diseases %	Other diseases Bushels :000 omitted
e.	2,287	0	0	0	0	0	0	0	0	-	-	-	-
. H.	1,944	0	0	0	0	0	0	t	+	t	+	-	-
t.	1,002	0	0	0	0	0	0	t	+	-	-	-	-
ss.	2,446	t	+	1.	25	0	0	t	+	t	+	2.	50
I.	201	t	+	1.	2	0	0	t	+	-	-	-	-
nn.	1,184	t	+	1.	12	0	0	t	+	.5	6	-	-
Y.	37,253	t	+	t	+	0	0	t	+	5.	1,961	2.	760
J.	2,464	1.	25	3.	76	.5	12	4.	103	2.	50	3.	76
rn.	17,775	t	+	6.	1,135	3.	550	8.	1,546	6.	1,135	4.	741
l.	500	t	+	5.	25	t	+	t	+	-	-	5.	26
.	2,365	t	+	3.	73	1.	24	3.	73	t	+	5.	125
.	9,000	t	+	t	+	t	+	t	+	2.	184	10.	1,000
Va.	8,174	t	+	t	+	t	+	2.	167	t	+	4.	341
C.	5,460	t	+	t	+	-	-	1.	55	-	-	8.	475
C.	800	10.	89	2.	16	5.	42	4.	33	1.	8	8.	69
.	1,760	10.	196	3.	54	t	+	6.	112	1.	18	5.	93
io	8,316	t	+	2.	170	1.	84	-	-	-	-	4.	347
d.	2,070	t	+	-		1.	21	-	-	-	-	4.	86
l.	3,213	0	0	1.	33	2.	66	1.5	49	4.	134	4.	134
ch.	10,966	0	0	-	-	-	-	-	-	5.	577	4.	157
c.	2,061	0	0	t	+	0	0	5.	109	5.	109	4.	86
nn.	792	0	0	1.	8	t	+	5.	42	.5	4	4.	33
va	1,620	-	-	-	-	t	+	-	-	3.	50	4.	68
	4,245	t	+	3.	131	1.	43	t	+	2.	87	4.	177

S. D.	109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nebr.	459	t	+	t	+	t	+	t	+	t	+	t	+	-	-	-	-	-	-	-	-	-	-
Kans.	2,139	0	0	2.	44	10.	238	2.	44	t	+	10.	53										
Ky.	3,780	5.	199	5.	199	1.	38	4.	158	5.	199	8.	329										
Tenn.	4,700	5.	247	10.	522	5.	247	5.	247	5.	247	8.	409										
Ala.	1,551	10.	172	5.	82	5.	82	1.	157	t	+	8.	135										
Miss.	488	t	+	2.	10	10.	54	3.	15	-	-	-	-										
Texas	198	2.	4	2.	4	5.	10	3.	6	-	-	5.	10										
Okla.	453	t	+	2.	9	t	+	t	+	0	0	-	-										
Ark.	1,314	-	-	5.	69	t	+	1.	13	2.	27	5.	69										
Mont.	790	0	0	0	0	t	+	t	+	t	-	1.	8										
Colo.	1,845	0	0	0	0	2.	38	2.	38	t	+	-	-										
N. Mex.	683	0	0	0	0	-	-	-	-	-	-	-	-										
Ariz.	152	0	0	0	0	-	-	-	-	-	-	-	-										
Utah	760	0	0	0	0	-	-	-	-	-	-	-	-										
Nev.	175	0	0	0	0	-	-	-	-	-	-	-	-										
Idaho	562	0	0	0	0	-	-	-	-	-	-	-	-										
Wash.	16,459	0	0	0	0	t	+	t	+	t	+	-	-										
Oreg.	3,500	0	0	0	0	t	+	t	+	2.	71	-	-										
Calif.	5,577	0	0	0	0	-	-	-	-	-	-	-	-										
U. S.	173,632	.5	932+	1.4	2,699+	.8	1,549+	1.5	2,967+	2.5	4,867+	3.2	6,259+										

Total reduction due to diseases 9.9 19,273+

Library,
Bureau of Plant Industry,
U. S. Department of Agriculture,
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